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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/536,462	12/05/2005	Mirko Lehmann	3000-0022	4952

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O"Shea Getz P.C.
1500 MAIN ST. SUITE 912
SPRINGFIELD, MA 01115

EXAMINER	
ENIN-OKUT, EDU E	
ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/536,462	LEHMANN, MIRKO	
	Examiner	Art Unit	
	Edu E. Enin-Okut	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 August 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) *24* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23 and 25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

FUEL CELL WITH FUEL SUPPLY DEVICE AND METHOD FOR PRODUCING THE SAME

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 17, 2009 has been entered. Applicant has amended claims 1 and 14; and, cancelled claim 24.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

5. Claims 2, 3, 4, 12, 14-23 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 2, 3, 4, 12 and 23, these claims recite the limitation "the fuel delivery device". There is insufficient antecedent basis for this limitation in the claim.

Regarding claims 14-23 and 25, claim 14 recites "... a reservoir containing fuel ...", "... a reactant delivery device configured to provide a reactant, where the reactant reacts with protons from the fuel ...", and "… where only reactant from the reservoir can react with the fuel …". It does not appear that the reactant is contained in the reservoir and, thus, it is unclear how "reactant *from the reservoir* can react with the fuel" (emphasis added).

Claim Rejections - 35 USC § 103

10. The rejections of claims 1-25 under 35 U.S.C. 103(a) as being unpatentable over D'Arrigo et al. (US 2003/0003347) in view of Keppeler (US 2002/0098399), Plust et al. (US 3,338,746), Mukerjee et al. (US 2002/0168560), Uchida et al. (US 6,057,051), and Anderten et al. (US 4,164,172) are withdrawn because claims 1 and 14 were amended; and, claim 24 was cancelled.

11. Claims 1 and 5-10 rejected under 35 U.S.C. 103(a) as being unpatentable over Jankowski et al. (US 2003/0039874) in view of Tanaka (US 2002/0076586). Additional supporting evidence provided by *Collins Dictionary of Computing*.

Regarding claims 1, 5 and 8, Jankowski teaches a micro-electro-mechanical systems (MEMS) based thin-film fuel cells, combined with full-integrated control circuitry, for electrical power applications (Abstract; para 7). Each MEMS-based fuel cell includes an anode; a cathode; an electrolyte layer separating the electrodes (e.g., a solid oxide or solid polymer material, or proton exchange membrane electrolyte materials); and, a host structure (or substrate) composed of materials such as silicon, glass, ceramic, or plastic fabricated using silicon micromachining techniques (Abstract; para. 30, 31, 32; Figs. 1, 2). The cell may incorporate a fuel reservoir as part of a package approach where the reservoir may be a volume containing a metal hydride or other material which is capable of storing hydrogen within it (and include some form of integrated microvalves placed in its micro-flow channels as a means of controlling the flow of fuel) (para. 18). As shown in Fig. 2, Jankowski depicts a fuel channel 29 (in communication with an electrode 25 and a fuel inlet 15 connected to the fuel reservoir) and an oxidant channel 30 (in communication with an electrode 27 and an oxidant inlet 17 enabling the flow of ambient air) (para. 32, 46; Fig. 2).

Jankowski does not expressly teach that the fuel is integrated in the material of at least one of the first electrode and an adjacent layer.

Tanaka teaches a fuel cell, usable in portable devices, with a fuel electrode assembly composed of a fuel electrode surrounded by a hydrogen absorber acting as a fuel source (Abstract; para. 53, 54, 55).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate a layer of material having fuel integrated therein onto an anode of the fuel cell of Jankowski because Tanaka teaches that this material can serve as a reservoir of fuel when the initial fuel source is not available (see Tanaka, para. 27, 28).

Regarding claims 6 and 7, Jankowski teaches that the electrical current generated from each cell is drawn away with an interconnect and support structure integrated with the gas manifold fabricated using integrated circuit type micro-fabrication processes (Abstract; para. 33).

Jankowski does not expressly teach that its integrated circuit is a CMOS circuit.

One of ordinary skill in the art would readily appreciate that CMOS is a form of construction for integrated circuits that requires very low power inputs and is now being extensively used both for microprocessors and for memories (see "CMOS" from *Collins Dictionary of Computing*). Therefore, this limitation has not been given patentable weight since the method of forming the device is not germane to the issue of patentability of the device itself. However, one of ordinary skill in the art would also appreciate that the electrical circuit of Jankowski, as modified by Tanaka, can be constructed using CMOS methodology because Jankowski teaches that this circuit is produced using integrated circuit type micro-fabrication processes.

Regarding claim 9, Jankowski teaches that the fuel cell has integrated control circuitry, as discussed above. The reference also teaches that that the fuel cell has an integrated resistive heater (and a micro-battery) used to heat up the fuel cell during start-up (para. 7, 11, 18 and 49). One of ordinary skill

in the art would appreciate that the integrated control circuitry of the fuel cell of Jankowski, as modified by Tanaka, will control components of the cell employed during start-up.

Regarding claim 10, Jankowski teaches that the use of MEMS processes to fabricate the fuel cell allows for individual control of gas flow using microvalves as well as the control and regulation of gas pressure or fuel flow throughout the device (Para. 31).

Regarding claim 13, Jankowski teaches a thin-film fuel cells, fabricated using MEMS processes and combined with full-integrated control circuitry, for electrical power applications (Abstract; para 7). Each MEMS-based fuel cell includes an anode and a cathode separated by an electrolyte layer (e.g., a solid oxide or solid polymer material, or proton exchange membrane electrolyte materials (Abstract; para. 30, 32; Figs. 1, 2).

Janowski does not expressly teach that the fuel delivery device is configured as an integral part of one of the electrodes; or, treating the material of the fuel delivery device with fuel.

Tanaka teaches a fuel cell, usable in portable devices, with a fuel electrode assembly composed of a fuel electrode surrounded by a hydrogen absorber acting as a fuel source (Abstract; para. 53, 54, 55). The hydrogen absorber absorbs and supports hydrogen that has been supplied from an external source (para. 54).

It would have been obvious to one of ordinary skill in the art at the time of the invention to integrate a treated, fuel delivery device with an anode of the fuel cell formed by the method of Jankowski because Tanaka teaches that fuel can be delivered to the electrode when an initial fuel source is not available, or when an external fuel source is not desirable (see Tanaka, para. 27, 28).

12. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jankowski et al. and Tanaka as applied to claims 1 and 5-10 above, and further in view of Mukerjee et al. (US 2002/0168560).

Jankowski and Tanaka are applied and incorporated herein for the reasons above.

Regarding claim 11, Jankowski teaches that the individual fuel cells may be incorporated into a module as a means of scaling power and voltage (para. 16). Jankowski and Tanaka do not expressly teach that the fuel cell is configured as a replaceable module.

Mukerjee teaches that a modular configuration of fuel cells permits the arrangement of the cells to be easily adjusted to meet specific physical design criteria, such as, for example, a particular packaging arrangement (para. 49). In addition, the modules can be serviced or replaced individually, and making maintenance easier by avoiding the disassembly of a fuel cell assembly (para. 49).

It would have been obvious to one of ordinary skill in the art at the time of the invention to make the fuel cell of Jankowski, as modified by Tanaka, a replaceable module because Mukerjee teaches that its eases the process of adjusting the arrangement of cells to the accommodate the size of the unit they are to be used, and improves the ease of cell maintenance.

Double Patenting

13. The rejection of claims 1-3 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 4, 6, 11, 12 and 14-16 of U.S. Patent No. 7,422,816 is maintained. (The nonstatutory obviousness-type double patenting rejection of claims 14 and 16 as being unpatentable over claims 1, 4, 6, 11, 12 and 14-16 of U.S. Patent No. 7,422,816 is withdrawn because claim 14 was amended.)

Although the conflicting claims are not identical, they are not patentably distinct from each other because all the elements of the instant application claims 1-3, 14 and 16 are to be found in US 7,422,816 claims 1, 4, 6, 11, 12 and 14-16 (as the instant application claims 1-3, 14 and 16 fully encompass US 7,422,816 claims 1, 4, 6, 11, 12 and 14-16) and therefore the above-described claims of US 7,422,816 anticipate those of the instant application.

Response to Arguments

14. Applicant's arguments, filed on August 17, 2009, have been considered but applicant has amended the claims such that new grounds of rejection were necessitated.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Edu E. Enin-Okut** whose telephone number is **571-270-3075**. The examiner can normally be reached on Monday to Thursday, 7 a.m. - 3 p.m. (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Edu E. Enin-Okut/
Examiner, Art Unit 1795

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795